

Transformations

STRAND: Measurement and Geometry

STRAND CONCEPT: Coordinates Planes and Transformations

SOL 5.14a, 7.7, 8.7a

Remediation Plan Summary

Students define and recognize transformations as movement of geometric figures through a translation, reflection, or rotation.

Common Misconceptions

- Students may incorrectly think that transformed figures are a different shape or size.
- Students may confuse a reflection over the x-axis is transformed horizontally and that a reflection over the y-axis is transformed vertically.

Materials

- Overhead Geoboard or graph paper
- Transformation Definitions Chart
- Translation, Reflection, Rotation activity sheet
- Similar Figures Recording Sheet
- Patty paper or tracing paper
- Move Those Shapes! activity sheet
- Reflecting on Transformations exit ticket
- Music

Introductory Activity

Begin by asking students to act out the motion of going down a roller coaster. Ask them whether they still look the same when they reach the bottom. (Their shape and orientation have not changed, but their location has changed.) Now, tell them to pretend they are making lunch, flipping hamburgers. Ask them what has changed for the flipped hamburger. (The shape has not changed, but the orientation has changed: it's been reversed, as a mirror image). Next, tell students to pretend they are playing basketball and their coach tells them to pivot. Ask them what has changed. (This move is simply a turn. Their shape has not changed, but their orientation has changed.) Emphasize that the shape of objects does not change when the objects are slid from place to place, flipped over, or turned around in place. Explain that there are three types of mathematical movements or transformations: translation (slide), reflection (flip), and rotation (turn).

Plan for Instruction

1. Demonstrate a **translation** on the overhead geoboard. Explain that a translation is a transformation in which an image is formed by moving every point on a pre-image the same distance in the same direction. Instruct students to demonstrate a translation on their geoboard.

AR Remediation Plan: Coordinate Planes and Transformations

2. Demonstrate a **reflection** on the overhead geoboard, and discuss how a reflection shows a “mirror image.” Explain that a reflection is a transformation in which corresponding points in the image and pre-image are equidistant from the line of reflection. Instruct students to demonstrate a reflection on their geoboard.
3. Demonstrate a **rotation** on the overhead geoboard. Explain that a rotation is a transformation in which an image is formed by rotating or turning its pre-image around a fixed center point. Instruct students to demonstrate a rotation on their geoboard.
4. Explain to students that each of these focus words indicates a specific movement. Play some music, and ask everyone to stand up and slide to the right with you, and then to slide to the left. Then, ask them to put their hands out in front of them and flip their hands repeatedly. Then, ask them to make quarter turns clockwise or counterclockwise. Have students practice slide steps, hand flips, and quarter turns to the beat of the music. Using the words *slide*, *flip*, and *turn*, call out various transformations for the students to demonstrate and gauge their understanding of these basic terms. Then, substitute the words *translate*, *reflect*, and *rotate* in your chant. (Note: If some students are strongly opposed to participating in this part of the activity, you may choose to have just a few volunteers demonstrate it. A few may even want to create a “transformation” dance.)
5. Give each student a “Transformation Definitions Chart” illustrating the same types of movements with geometric figures. Connect the actual movements to the geometric movements through discussion.
6. Have students complete the “Translation, Reflection, Rotation” activity sheet. If necessary, demonstrate how to use patty paper or tracing paper to copy one of the shapes and perform the transformations.
7. Pair up the students, and have them complete the “Move Those Shapes” activity by following the directions on the sheet.

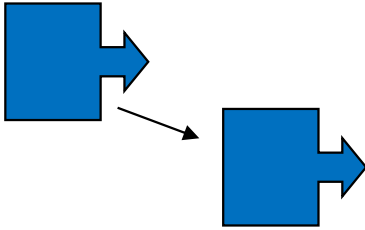
Pulling It All Together (Reflection)

Have students complete the “Reflecting on Transformations” exit ticket.

Note: The following pages are intended for classroom use for students as a visual aid to learning.

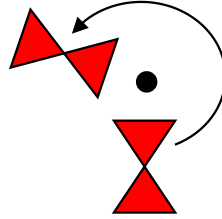
Transformation Definitions Chart

Translation (slide)



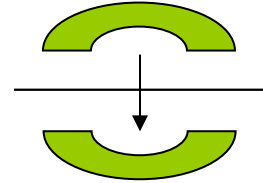
A transformation in which an image is formed by moving every point on a figure the same distance in the same direction.

Rotation (turn)



A transformation in which an image is formed by turning its pre-image around a fixed point.

Reflection (flip)

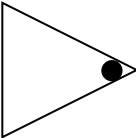

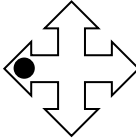

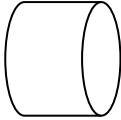

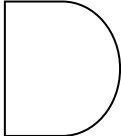



A transformation in which a figure is flipped over a line, called the line of reflection. All corresponding points in the image and pre-image are equidistant from the line of reflection.

Name: _____

Translation, Reflection, Rotation

Trace each original figure. Use tracing paper to perform a translation, reflection, and rotation, and draw the result of each in the appropriate box.

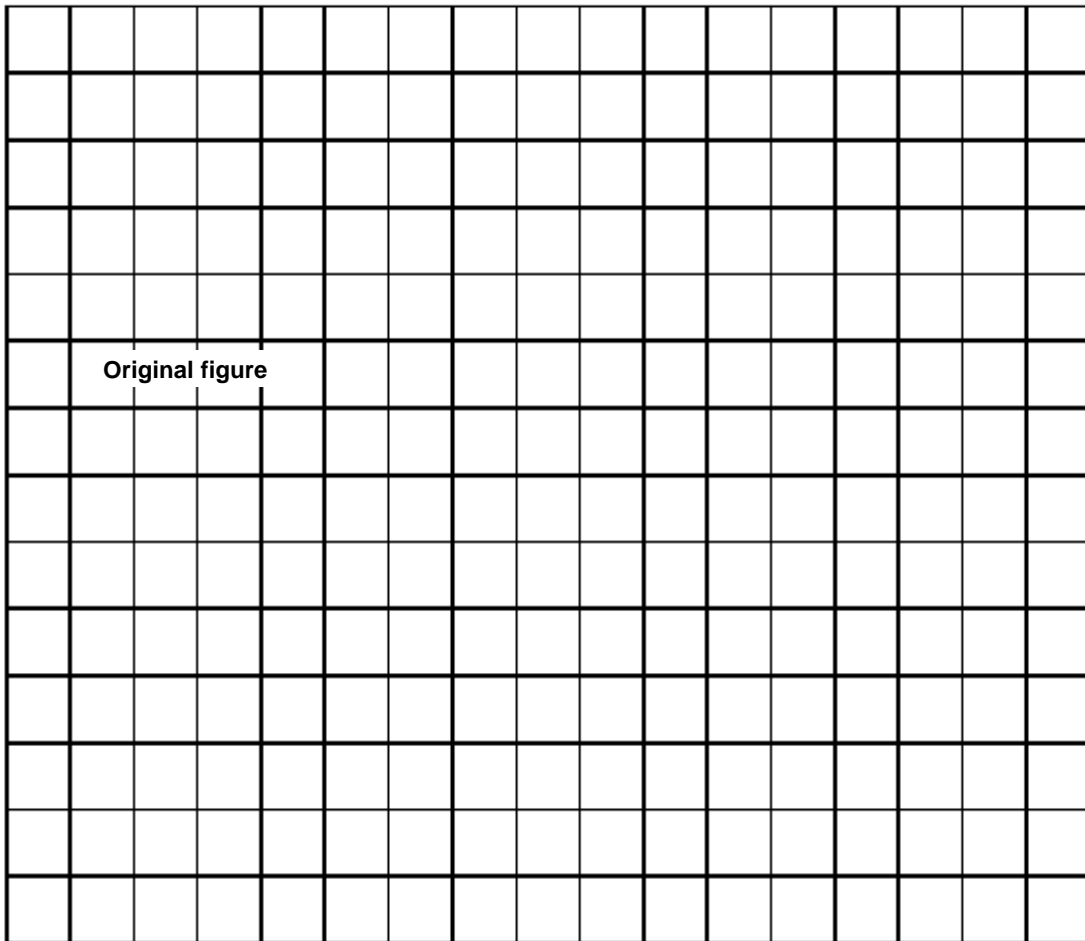
Original Figure	Translation	Reflection	Rotation
			
			
			
			
			
			
			
			

Name: _____

Move Those Shapes!

Draw all three transformations discussed in this lesson: **translation**, **reflection**, and **rotation**. Draw a figure in the top left portion of the grid paper. The figure should be different from all the others used in this lesson. Perform the first transformation on the original figure, and label the new figure "Figure B." Perform the second transformation on Figure B, and label the new figure "Figure C." Perform the final transformation on Figure C, and label the new figure "Figure D." Draw arrows to show the direction of each transformation.

Transformations: Fig. B. _____ Fig. C. _____ Fig. D. _____

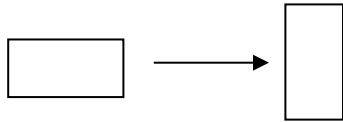


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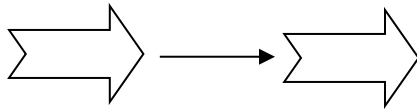
Reflecting on Transformations

For each change in position of the figures below, determine the type of transformation it is, and write the name of the transformation on the line provided.

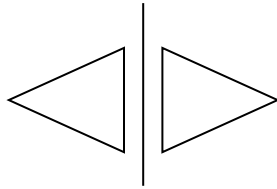
1. The example below is an illustration of a _____.



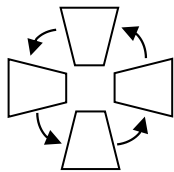
2. The example below is an illustration of a _____.



3. The example below is an illustration of a _____.



4. The example below is an illustration of a _____.



5. Write directions about how to go from your bedroom to your kitchen, using the verbs *translate*, *reflect*, and *rotate*.